

REMARKS

The present invention resides in the relatively competitive and crowded field of miniaturized multi-layer magnetic parts such as transformers to facilitate the relatively small electronic components in consumer products that are available today.

As can be appreciated, a number of large international companies have utilized scientists and engineers to not only miniaturize electronic components but to improve their performance. These goals must be met, however, in an economical manner in view of the highly competitive nature of this industry. Accordingly, the present invention should be evaluated as to its patentable merits in consideration of these competitive pressures.

The present invention has recognized the problems of adequately reducing the leakage of magnetic flux in such small component parts while maintaining the insulation of the windings, for example of a transformer or other component. The present inventors have recognized the problems that have occurred, for example through the diffusion of conductive material when component parts are provided in the form of a liquid paste.

The present invention seeks to provide one or preferably a plurality of composite solid sheets that provide a magnetic core member and a surrounding periphery of a magnetic pattern with an intermediate dielectric pattern which has the capacity to support, for example one of the primary or secondary winding with the only discontinuities being via or through holes for electrical connection with the windings. These composite sheets can be laminated together when a pair of magnetic sheets are sandwiched about them and pressed together to provide a connection not only through a magnetic core member but also through the periphery magnetic pattern.

The composite sheet or sheets and the pair of magnetic sheets are configured to complement each other and to be of approximately the same thickness. Additional wiring patterns and terminal electrodes can be provided on the exterior while maintaining appropriate insulation of the secondary and primary windings with an improved magnetic coupling coefficient.

The Office Action raised an issue with regards to Claim 4 and 5 as being dependent on dependent Claim 3. The claims have now been amended to moot this rejection.

Additionally, new Claims 6-14 are provided while Claim 1 has been amended.

The Office Action rejected Claims 1-3 as being completely anticipated by the *Matsuta et al.* (U.S. Patent No. 6,710,694).

Matsuta et al. sought to address a problem in the prior art, where a difference in any relative permeability in the magnetic layer could have a strong affect on the inductance of layered coils disbursed in an adhesive layer. As defined in Column 3, Lines 18-21, coils of a spiral shape were preferably provided with a through hole located at the approximate center of each coil to address this issue. Reference can be made to Figure 2 where rectangular through holes 14 are located on each of the dielectric members 11A.

On opposite sides, the rectangular holes 15 are also provided in the dielectric members. Winding patterns 13A and 13B and 12A and 12B are sandwiched between similar dielectric sheets. A magnetic layer 20 is mounted above a dielectric sheet and is spaced from a thicker magnetic sheet 2 by an adhesive layer 30. The adhesive layer is non-magnetic and purportedly, can provide the appropriate inductance by maintaining a predetermined permeability range of 2 through 7 of the magnetic layer, and an appropriate thickness between the first and second magnetic substrates of between 70 μ m or less.

As can be appreciated, the *Matsuta et al.* reference provides basically a central laminated body 10 of separate dielectric sheets and windings. This laminated body of just dielectric sheets then has a magnetic material applied by a printing method so that a liquid paste of a polyamide resin containing fine ferrite powder is inserted into the appropriate central rectangular hole 14 and the opposite side rectangular holes 15. See Column 9, Lines 21-40.

Subsequently, an adhesive material 30 of a controlled thickness (to match the desired inductance) is applied by a spin coating method. Finally, the magnetic substrates are bonded. See Column 9, Lines 41-67.

The *Matsuta et al.* reference in seeking to maintain a desired inductance, limits the distance of the laminated body between the first and second magnetic substrates to 70 μ m or less. Purportedly, if the distance increases the desired inductance, which is the design goal of *Matsuta et al.*, cannot be obtained. See Column 3, Lines 62-63.

Referring to our specification on Page 14, Lines 13-20, our dielectric and magnetic pattern sheets alone have a thickness of approximately 50 μ m and the number of stacked sheets could be 10 to 50. This should be compared with the teachings in the *Matsuta et al.* reference in Column 7, Line 4, where the thickness of the dielectric sheets should be maintained to about 1 μ m to 3 μ m.

Given these limitations, the directions to a person of ordinary skill in this field, would find that there is no teaching in the *Matsuta et al.* reference of a composite sheet consisting of an intermediate dielectric pattern with a central solid portion of magnetic material and a peripheral solid portion of magnetic material of equal thickness. The dielectric sheets of the *Matsuta et al.* reference 11A, provided only holes, not a magnetic material and the subsequent magnetic material is supplied in a manner sought to be avoided, as defined in our Description of the Related Art on Page 3, Lines 13-19.

Our invention as defined in the present claims, permits the composite sheets to comprise both magnetic patterns and dielectric separating patterns that can be compressed to directly form a central magnetic core and a magnetic periphery surrounding the dielectric pattern. As can be appreciated, the dimensions of our resulting product would grossly violate the size limitations specified as critical as to in thickness in both the specification and dependent Claim 6 of the *Matsuta et al.* disclosure.

“An anticipating reference must describe the patented subject matter with sufficient clarity and detail to establish that the subject matter existed in the prior art and that such existence would be recognized by persons of ordinary skill in the field of the invention.” See *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990); *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 678, 7 USPQ2d 1315, 1317 (Fed. Cir. 1988).

In summary, our amended Claim 1 and the newly drafted independent Claims 6 and 10 define a structure of unique composite sheets that are certainly not taught nor suggested by the cited reference. Additionally, the *Matsuta et al.* reference requires specific thickness dimensions to achieve the purpose of its invention. A person of ordinary skill in the field would accordingly be directed by the *Matsuta et al.* reference to maintain the overall thickness of its multi-layer magnetic part to be under 70 μ m.

Applicants provide a pair of magnetic sheets alone that would constitute 200 μ m while the unique composite sheets of our present invention have an additional thicknesses of 50 μ m for each sheet.

In MPEP 2143.01 the Examiners are instructed as follows:

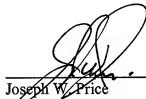
If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

It is respectfully submitted that our current claims are now allowable over the cited reference and an early notification of allowance is requested.

If the Examiner believes a telephone interview will assist in the prosecution of this matter, the undersigned attorney can be contacted at the listed phone number.

Very truly yours,

SNELL & WILMER L.L.P.

A handwritten signature in black ink, appearing to read 'Joseph W. Price', is written over a horizontal line.

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